A NEW WINGLESS STONEFLY, *SCOPURA JIRI* (PLECOPTERA: SCOPURIDAE), FROM KOREA[1]

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ABSTRACT: A new species, *Scopura jiri* sp. n., in the wingless stonefly family Scopuridae is described from Korea with figures of key characters. The male adult of *S. jiri* can be distinguished from other congeners by the elongated lateral projections of the epiproct, by the absence of a basal projection of the cerci, and by the presence of a median sclerite on the penis. The nymph can be distinguished by the presence of a pair of lateral swellings and a median swelling on the epiproct. Distributional and taxonomic remarks are provided.

KEY WORDS: Plecoptera, Scopuridae, *Scopura jiri,* wingless stonefly, headwater stream, Korea

The Scopuridae is unique among the Plecoptera taxa due to their absolute winglessness in both the adult and nymphal stages. The family is regarded as a basal clade of Hologhatha in the Plecoptera phylogeny (Zwick 2000). The family includes seven species in the monotypic genus *Scopura* and is geographically limited to Northeast Asia (Uchida and Maruyama 1987; Jin and Bae 2005).

Uéno (1929) described *Scopura longa* from Japan. Uchida and Maruyama (1987) described *S. montana* Maruyama, *S. bihamulata* Uchida, and *S. quattuorhamulata* Uchida from Japan and *S. laminata* Uchida from Korea. Jin and Bae (2005) described *S. gaya* Jin and Bae and *S. scorea* Jin and Bae from Korea. In addition to the above species, one new *Scopura* species was recently discovered in the southwestern part of Korea. We herein describe this species.

The adult and nymphal materials were collected with hand nets. They were preserved in 80 percent ethyl alcohol and deposited in the Aquatic Insect Collection of Seoul Women's University (SWU-AIC). The characters and terminology used in this paper follow those of Jin and Bae (2005).

Scopura jiri sp. n.

(Figs. 1-13)

Adult Male. Body length 18.5mm; body surface shiny, light brown to brown with dark brown markings. *Head:* Head width 3.4mm. *Thorax:* Nota greatly expanded, with irregular dark brown markings. Pronotum (Fig. 1) lateral expansions without dorsal hump; distance between anterolateral corners 3.3mm; posterolateral expansion well developed and round; length of posterolateral expansions 0.8mm; distance between posterolateral expansions 3.9mm. Mesonotum (Fig. 2) lateral expansions without dorsal hump; length of posterolateral expansions 0.7mm; distance between posterolateral expansions 4.5mm; anterior projections pointed (height 0.2mm anteriorly); posterior projections pointed (height 0.2mm posteriorly). Metanotum (Fig. 3) lateral expansions without dorsal hump; length of posterolateral expansions 0.6mm; distance between posterolateral expansions 4.1mm; anterior projections pointed and greatly elongated to level of posterior projections (height 0.2 mm posteriorly); posterior projections moderately angled (height 0.2 mm posteriorly). Femora light brown, without stripe. Tibiae light brown, without stripe. *Abdomen:* Abdominal terga I-VII (Fig. 4) with dark brown transverse stripes (stripes on anterior terga thicker: terga I-II almost dark brown; stripes on

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terga III-V relatively thick and distinct; stripes on terga VI-VII relatively thin and vague). Tergum IX (Fig. 5) posterior 2/3 slightly elevated dorsally from lateral view, with setae in posterolateral parts and posterior margin. Epiproct (Figs. 6-7) with pair of lateral projections and pair of submedian projections; lateral projections elongated and widely separated (0.8mm in distance between apices of lateral projections), located ca. 2/3 apically and as high as top of membranous part of epiproct, relatively distant from membranous part of epiproct, curved anteriorly from lateral view, with short setae posteroapically; submedian projections small and relatively widely separated, apically blunt and directed anteriorly; membranous part of epiproct U-shaped, with tiny setae. Cerci (Figs. 8-9) without basal projection; base of cerci with many short setae along posteromesial margin. Penis (Fig. 10) apically dark brown, with lateral and median sclerites; lateral sclerites elongated, apically narrower and darker, basally broader and lighter; median sclerite bell-shaped, apically darker.

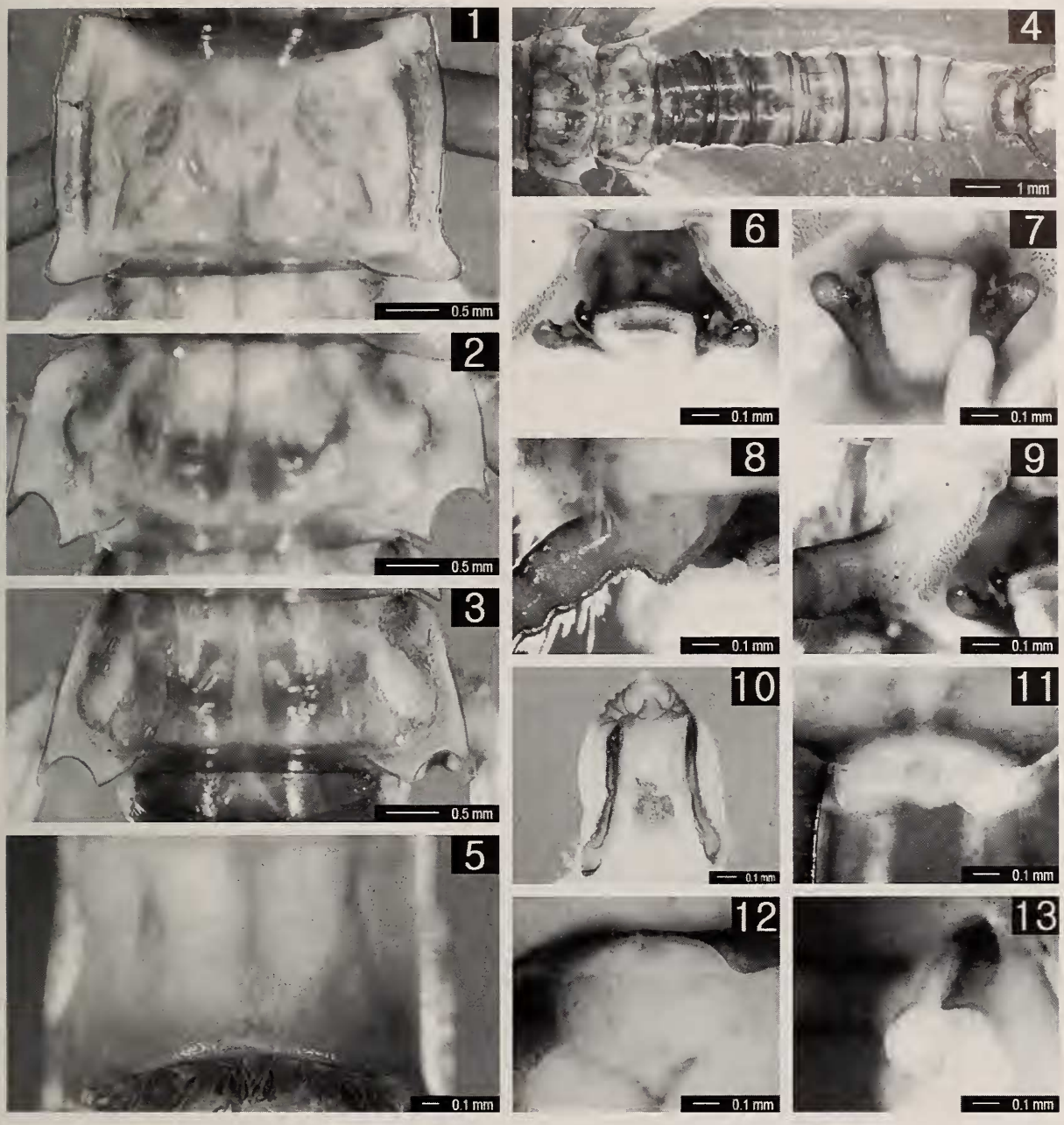
Adult Female. Unknown.

Nymph. General body shape and color pattern similar to adult but blunt in shape and dull in color. Epiproct of mature male nymph (Figs. 11-13) with median and pair of lateral membranous swellings, with dorsal transverse sclerite and concavity; median swelling located basally; lateral swellings directed posteriorly (not expanded laterally from dorsal view) (Fig. 11), located laterally and lower than concavity from posterior view (Fig. 12), and located basally from lateral view (Fig. 13).

Differential Diagnosis. *Scopura jiri* sp. n. can be distinguished from other congeners by the following characters. The male adult of *S. jiri* possesses two pairs of distinct projections on the epiproct (submedian and lateral projections), similar to the other Korean species (*S. gaya*, *S. laminata*, and *S. scorea*) and a Japanese species (*S. quattuorhamulata*). Both *S. jiri* and *S. quattuorhamulata* possess widely separated submedian projections in the epiproct, but the lateral projections of *S. jiri* (Figs. 6, 7) are longer than those of *S. quattuorhamulata.* The male adult of *S. jiri* can also be distinguished by the absence of a basal projection of the cerci (Fig. 8, 9) and by the presence of a round median sclerite of the penis (Fig. 10). The nymph of *S. jiri* can be distinguished from other species of *Scopura* by the presence of both a pair of lateral swellings and a basal median swelling in the epiproct. The shape of the epiproct of *S. jiri* is similar to that of *S. scorea,* but the lateral swellings of *S. jiri* are in a lower location than those of *S. scorea* from a lateral view (Fig. 13).

Remarks. When Uchida and Maruyama (1987) described *S. laminata* (nymph only) from Odaesan (Mt.) in the middle of the Korean Peninsula, they presented another type of nymph, noted as the "Jirisan type of *S. laminata*," from Jirisan (Mt.) (see material examined, below). These nymphs are separated by the degree of the swellings on the epiproct. The male and female adults of *S. laminata* were described by Jin and Bae (2005) based on material collected from the type locality of *S. laminata.* The adults of the "Jirisan type of *S. laminata*," however, have not been collected from the locality visited by Uchida and Maruyama (1987). It is possible that the "Jirisan type of *S. laminata*" belongs to *S. jiri,* not only because the shape of the nymphal epiproct is similar, but also because the type locality of *S. jiri* (Nogodan in Jirisan) is close (ca. 15 km) to Uchida and Maruyama's (1987) locality of the "Jirisan type of *S. laminata*" (Hanshingyegok in Jirisan).

Etymology. The specific epithet *jiri* (noun) refers to the type locality.



Figs. 1-10. *Scopura jiri* sp. n., adult male: 1. pronotum. 2. mesonotum. 3. metanotum. 4. abdominal terga. 5. 9th abdominal tergum. 6. epiproct, dorsal. 7. epiproct, posterior. 8. basal cercus, dorsal. 9. basal cercus, posterior. 10. penis, dissected.

Figs. 11-13. *Scopura jiri* sp. n., mature male nymph: 11. epiproct, dorsal. 12. epiproct, posterior. 13. epiproct, lateral.

Material Examined. *Holotype:* Male adult (SWU-PLE-501), South Korea, Jeollanam-do (province), Gurye-gun, Sandong-myeon, Jwasa-ri, Jirisan (Mt.), Nogodan, a headwater stream at 100m west from Nogodan shelter, alt. 1300m, 27-X-2003, Y. H. Jin [SWU-AIC]. *Paratypes:* 1 male and 1 female nymphs (SWU-PLE-502), same locality and data as holotype [SWU-AIC]; 8 male and 10 female nymphs (SWU-PLE-503-512), same locality as holotype, 12-VIII-2000, D. H. Won [SWU-

AIC]. *Other materials.* 1 female nymph, same locality and data as holotype [SWU-AIC]; 2 female nymphs, same locality as holotype, 12-VIII-2000, D. H. Won [SWU-AIC]. *Scopura* sp. ("Jirisan type of *S. laminata*"): 6 male and 5 female nymphs, Korea, Gyeongsangnam-do, Chirisan (= Jirisan), Hanshingyegok (valley), alt. 1400m, 5-VI-1983, S. Uchida [Lake Biwa Museum].

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